WHAT IS CLAIMED IS:

1. A cleaning composition for a semiconductive substrate, comprising: a cleaning agent and at least one antimicrobial agent.

2. The cleaning composition of Claim 1, wherein the cleaning agent comprises a hydroxycarboxylic acid, a hydroxycarboxylic acid salt, or a mixture thereof.

3. The cleaning composition of Claim 2, wherein the cleaning agent comprises a hydroxycarboxylic acid selected from the group consisting of citric acid, malic acid, tartaric acid, glycolic acid, lactic acid, and tartronic acid.

4. The cleaning composition of Claim 2, wherein the cleaning agent comprises a hydroxycarboxylic acid salt selected from the group consisting of a citric acid salt, malic acid salt, tartaric acid salt, glycolic acid salt, lactic acid salt, and tartronic acid salt.

5. The cleaning composition of Claim 2, wherein the cleaning agent is selected from the group consisting of citric acid and citric acid salts.

6. The cleaning composition of Claim 5, wherein the cleaning agent comprises a citric acid salt selected from the group consisting of ammonium citrate, and a tetraalkylammonium citrate.

7. The cleaning composition of Claim 1, wherein the antimicrobial agent is selected from the group consisting of benzoic acid, sorbic acid, and salts thereof.

8. The cleaning composition of Claim 7, wherein the antimicrobial agent comprises a benzoic acid salt selected from the group consisting of ammonium benzoate, potassium benzoate, and tetraalkylammonium benzoate.

9. The cleaning composition of Claim 7, wherein the antimicrobial agent comprises a sorbic acid salt selected from the group consisting of ammonium sorbate, potassium sorbate, and tetraalkylammonium sorbate.

10. The cleaning composition of Claim 7, wherein the antimicrobial agent is selected from the group consisting of benzoic acid, sorbic acid, ammonium benzoate, potassium benzoate, tetraalkylammonium benzoate, potassium sorbate, ammonium sorbate, and tetraalkylammonium sorbate.

11. The cleaning composition of Claim 1, wherein the antimicrobial agent comprises a sulfite.

12. The cleaning composition of Claim 11, wherein the antimicrobial agent is selected from the group consisting of sulfur dioxide, potassium bisulfite, and potassium metabisulfite.

13. The cleaning composition of Claim 1, wherein the antimicrobial agent comprises an alkyl parahydroxybenzoate.

14. The cleaning composition of Claim 13, wherein the antimicrobial agent is selected from the group consisting of methylparahydroxybenzoate, ethylparahydroxybenzoate, propylparahydroxybenzoate, and n-heptylparahydroxybenzoate.

15. The cleaning composition Claim 1, having a pH of about 4.5 to about 6.5.

16. The cleaning composition of Claim 15, further comprising a buffering agent.

17. The cleaning composition of Claim 16, wherein the buffering agent is selected from the group consisting of ammonium hydroxide, and tetraalkylammonium hydroxide.

18. A cleaning composition for a semiconductor substrate, comprising: a cleaning agent selected from the group consisting of hydroxycarboxylic acids and salts thereof; and at least one antimicrobial agent selected from the group consisting of benzoic acid, sorbic acid, and salts thereof.

19. The cleaning composition of Claim 18, wherein the cleaning agent is selected from the group consisting of citric acid, malic acid, tartaric acid, glycolic acid, lactic acid, tartronic acid, and salts thereof.

20. The cleaning composition of Claim 19, wherein the cleaning agent is selected from the group consisting of citric acid, ammonium citrate, and tetraalkylammonium citrate.

21. The cleaning composition of Claim 18, wherein the antibacterial agent comprises a benzoic acid salt selected from the group consisting of ammonium benzoate, potassium benzoate, and tetraalkylammonium benzoate.

22. The cleaning composition of Claim 18, wherein the antibacterial agent comprises a sorbic acid salt selected from the group consisting of potassium sorbate, ammonium sorbate, and tetraalkylammonium sorbate.

23. The cleaning composition of Claim 18, wherein the solvent is selected from the group consisting of water, and an organic solvent.

24. The cleaning composition of Claim 23, wherein the solvent comprises deionized water.

25. The cleaning composition of Claim 23, wherein the solvent comprises an organic solvent selected from the group consisting of methanol, ethanol, n-propanol, iso-propanol, n-butanol, t-butanol, sec-butanol, ethylene glycol, and propylene glycol.

26. The cleaning composition of Claim 18, having a pH of about 4.5 to about 6.5.

27. The cleaning composition of Claim 18, wherein the cleaning composition further comprises a pH buffering agent to adjust the pH to about 4 to about 6.

28. A cleaning composition for a semiconductor substrate, comprising: a cleaning agent selected from the group consisting of citric acid and a citric acid salt; and an antimicrobial agent selected from the group consisting of benzoic acid, sorbic acid, and salts thereof.

29. The cleaning composition of Claim 28, wherein the antimicrobial agent comprises a benzoic acid salt selected from the group consisting of ammonium benzoate, potassium benzoate, and tetraalkylammonium benzoate.

30. The cleaning composition of Claim 28, wherein the antimicrobial agent comprises a sorbic acid salt selected from the group consisting of ammonium sorbate, potassium sorbate, tetraalkylammonium sorbate.

31. A cleaning composition for a semiconductor substrate, comprising: a cleaning agent capable of dispersing alumina or silica slurry particles, and supporting microbial growth; and an antimicrobial agent.

32. The cleaning composition of Claim 31, wherein the cleaning agent comprises a hydroxycarboxylic acid selected from the group consisting of a hydroxycarboxylic acid, and hydroxycarboxylic acid salts.

33. The cleaning composition of Claim 32, wherein the cleaning agent is selected from the group consisting of citric acid, malic acid, tartaric acid, glycolic acid, lactic acid, and tartronic acid.

34. The cleaning composition of Claim 32, wherein the cleaning agent comprises citric acid or a salt thereof.

35. The cleaning composition of Claim 34, wherein the cleaning agent comprises a citric acid salt selected from the group consisting of ammonium citrate, and tetraalkylammonium citrate.

36. The cleaning composition of Claim 35, wherein the cleaning agent comprises tetramethylammonium citrate.

37. The cleaning composition of Claim 31, wherein the antimicrobial agent is selected from the group consisting of benzoic acid, sorbic acid, ammonium benzoate, potassium benzoate, tetraalkylammonium benzoate, ammonium sorbate, potassium sorbate, and tetraalkylammonium sorbate.

38. The cleaning composition of Claim 31, wherein the antimicrobial agent comprises a sulfite.

39. The cleaning composition of Claim 38, wherein the antimicrobial agent is selected from the group consisting of sulfur dioxide, potassium bisulfite, and potassium metabisulfite.

40. The cleaning composition of Claim 31, wherein the antimicrobial agent comprises an alkyl parahydroxybenzoate.

41. The cleaning composition of Claim 40, wherein the antimicrobial agent is selected from the group consisting of methylparahydroxybenzoate, ethylparahydroxybenzoate, propylparahydroxybenzoate, and n-heptylparahydroxybenzoate.

42. A cleaning composition for a semiconductor surface, comprising an aqueous composition comprising:

about 0.02 to about 1.5 % by weight cleaning agent;

about 0.005 to about 0.3 % by weight antimicrobial agent; and

the balance solvent;

the % by weight based on the total weight of the cleaning composition.

43. The cleaning composition of Claim 42, wherein the cleaning agent is selected from the group consisting of hydroxycarboxylic acids and salts thereof.

44. The cleaning composition of Claim 43, wherein the cleaning agent is selected from the group consisting of citric acid, malic acid, tartaric acid, lactic acid, glycolic acid, tartronic acid, and salts thereof.

45. The cleaning composition of Claim 43, wherein the cleaning agent is selected from the group consisting of citric acid, ammonium citrate, and tetraalkylammonium citrate.

46. The cleaning composition of Claim 42, wherein the antimicrobial agent is selected from the group consisting of benzoic acid, sorbic acid, and salts thereof.

47. The cleaning composition of Claim 42, wherein the antimicrobial agent is selected from the group consisting of benzoic acid, sorbic acid, ammonium benzoate, potassium benzoate, tetraalkylammonium benzoate, ammonium sorbate, potassium sorbate, and tetraalkylammonium sorbate.

48. The cleaning composition of Claim 42, wherein the antimicrobial agent is selected from the group consisting of a sulfite, and an alkyl parahydroxybenzoate.

49. The cleaning composition of Claim 42, wherein the pH of the composition is about 4.5 to about 6.5.

50. The cleaning composition of Claim 42, comprising:
about 0.05 to about 0.5 % by weight cleaning agent; and
about 0.01 to about 0.2 % by weight antimicrobial agent.

51. A cleaning composition for a semiconductor surface, comprising an aqueous mixture comprising:

about 0.02 to about 1.5 % by weight cleaning agent selected from the group consisting of hydroxycarboxylic acids and salts thereof;

about 0.005 to about 0.3 % by weight of a first antimicrobial agent selected from the group consisting of benzoic acid and salts thereof;

about 0.005 to about 0.3 % by weight of a second antimicrobial agent selected from the group consisting of sorbic acid and salts thereof; and

the balance solvent;

the % by weight based on the total weight of the cleaning composition.

52. A cleaning composition for a semiconductor surface, comprising:
about 0.02 to about 1.5 % by weight citric acid, citric acid salt, or a mixture thereof;
about 0.005 to about 0.3 % by weight benzoic acid, benzoic salt, or a mixture thereof;
about 0.005 to about 0.3 % by weight sorbic acid, sorbic acid salt, or a mixture thereof; and
the balance solvent;
the % by weight based on the total weight of the cleaning composition.

53. The cleaning composition of Claim 52, wherein the solvent comprises deionized water.

54. A cleaning composition for a semiconductor surface, comprising:
about 0.02 to about 1.5 % by weight of a cleaning agent selected from the group consisting of citric acid, ammonium citrate, and tetraalkylammonium citrate;
about 0.005 to about 0.3 % by weight of a first antimicrobial agent selected from the group consisting of benzoic acid, potassium benzoate, ammonium benzoate, and tetraalkylammonium benzoate;
about 0.005 to about 0.3 % by weight of a second microbial agent selected from the group consisting of sorbic acid, potassium sorbate, ammonium sorbate, and tetraalkylammonium sorbate; and
the balance water;
the % by weight based on the total weight of the cleaning composition.

55. A cleaning composition for a semiconductor surface, comprising: an acidic aqueous solution comprising a cleaning agent selected from the group consisting of citric acid and citric acid salts; one or more antimicrobial agents selected from the group consisting of a benzoic acid, benzoic acid salts, sorbic acid, and sorbic acid salts; and water.

56. The cleaning composition of Claim 55, wherein the cleaning agent is a selected from the group consisting of citric acid, ammonium citrate, and tetraalkylammonium citrate.

57. The cleaning composition of Claim 55, wherein the antimicrobial agent is selected from the group consisting of benzoic acid, sorbic acid, potassium benzoate, ammonium benzoate, tetraalkylammonium benzoate, potassium sorbate, ammonium sorbate, and tetraalkylammonium sorbate.

58. The cleaning composition of Claim 55, comprising ammonium citrate, potassium benzoate, and potassium sorbate.

59. The cleaning composition of Claim 55, comprising ammonium citrate, ammonium benzoate, and potassium sorbate.

60. A cleaning composition for a semiconductor surface comprising an acidic aqueous solution comprising: about 0.02 to about 1.5 % by weight citric acid, citric acid salt, or a mixture thereof; about 0.005 to about 0.3 % by weight antimicrobial agent; and the balance water based on the total weight of the cleaning composition; the antimicrobial agent selected from the group consisting of benzoic acid, sorbic acid, potassium benzoate, ammonium benzoate, tetraalkylammonium benzoate, potassium sorbate, ammonium sorbate, tetraalkylammonium sorbate, methylparahydroxybenzoate, ethylparahydroxybenzoate, propylparahydroxybenzoate, and n-heptylparahydroxybenzoate, sulfur dioxide, potassium bisulfite, and potassium metabisulfite.

61. The cleaning composition of Claim 60, wherein the composition has a pH of about 4.5 to about 6.5.

62. A cleaning composition for cleaning a planarized or polished surface of a semiconductor wafer, the composition comprising: a mixture of a cleaning agent, an antimicrobial agent, and solvent in amounts relative to one another such that microbial growth within the cleaning composition is inhibited, and when the composition is in contact with both a metal conductive structure and a dielectric layer, residual particles are removed therefrom with no significant defects to the conductive structure or the dielectric layer, and microbial deposition on the planarized or polished surface is inhibited.

63. The cleaning composition of Claim 62, comprising about 0.02 % to about 1.5 % of a cleaning agent comprising a hydroxycarboxylic acid, a hydroxycarboxylic acid salt, or a mixture thereof.

64. The cleaning composition of Claim 63, wherein the cleaning agent comprises citric acid, citric acid salt, or a mixture thereof.

65. The cleaning composition of Claim 62, comprising about 0.005 % to about 0.3 % antimicrobial agent.

66. The cleaning composition of Claim 62, wherein the antimicrobial agent is selected from the group consisting of benzoic acid, sorbic acid, potassium benzoate, ammonium benzoate, tetraalkylammonium benzoate, potassium sorbate, ammonium sorbate, tetraalkylammonium sorbate, benzoic acid, sorbic acid, ammonium benzoate, potassium benzoate, tetraalkylammonium benzoate, ammonium sorbate, potassium sorbate, and tetraalkylammonium sorbate.

67. The cleaning composition of Claim 62, wherein the antimicrobial agent is selected from the group consisting of a sulfite, and an alkyl parahydroxybenzoate.

68. The cleaning composition of Claim 67, wherein the antimicrobial agent is selected from the group consisting of sulfur dioxide, potassium bisulfite, and potassium metabisulfite.

69. The cleaning composition of Claim 67, wherein the antimicrobial agent is selected from the group consisting of methylparahydroxybenzoate, ethylparahydroxybenzoate, propylparahydroxybenzoate, and n-heptylparahydroxybenzoate.

70. The cleaning composition of Claim 62, wherein the solvent comprises water, an organic solvent, or a mixture thereof.

71. The cleaning composition of Claim 62, wherein the solvent comprises deionized water.

72. The cleaning composition of Claim 62, having a pH of between about 4.5 and about 6.5.

73. The cleaning composition of Claim 62, having a pH of between about 5 and about 6.

74. The cleaning composition of Claim 62, wherein the metal conductive structure comprises a metal selected from the group consisting of copper, aluminum, silver, tungsten, platinum, titanium, and tantalum.

75. The cleaning composition of Claim 62, wherein the dielectric layer comprises a dielectric material selected from the group consisting of silicon dioxide, phosphosilicate glass, borosilicate glass, borophosphosilicate glass, carbon-doped silica, and porous silica.

76. The cleaning composition of Claim 62, wherein the residual particles comprise metal particles.

77. The cleaning composition of Claim 76, wherein the metal particles are selected from the group consisting of copper, aluminum, platinum, titanium, silver, tungsten, and tantalum particles.

78. The cleaning composition of Claim 62, wherein the residual particles comprise abrasive slurry particles.

79. The cleaning composition of Claim 78, wherein the abrasive slurry particles are selected from the group consisting of aluminum oxide, titanium dioxide, silicon dioxide, cerium dioxide, and mixtures thereof.

80. A method for cleaning a surface of a semiconductor wafer, comprising the steps of:

contacting the semiconductor wafer with a cleaning solution comprising a cleaning agent, and an antimicrobial agent; wherein microbial deposition on the cleaned surface of the semiconductor wafer is inhibited.

81. The method of Claim 80, wherein the cleaning agent is selected from the group consisting of hydroxycarboxylic acids and salts thereof.

82. The method of Claim 81, wherein the cleaning agent is selected from the group consisting of citric acid, malic acid, tartaric acid, lactic acid, glycolic acid, tartronic acid, and salts thereof.

83. The method of Claim 81, wherein the cleaning agent is selected from the group consisting of citric acid, ammonium citrate, and tetraalkylammonium citrate.

84. The method of Claim 80, wherein the antimicrobial agent is selected from the group consisting of benzoic acid, benzoic acid salts, sorbic acid, and sorbic acid salts.

85. The method of Claim 80, wherein the antimicrobial agent is selected from the group consisting of benzoic acid, ammonium benzoate, potassium benzoate, and tetraalkylammonium benzoate.

86. The method of Claim 80, wherein the antimicrobial agent is selected from the group consisting of sorbic acid, potassium sorbate, ammonium sorbate, and tetraalkylammonium sorbate.

87. The method of Claim 80, wherein the antimicrobial agent is selected from the group consisting of benzoic acid, sorbic acid, ammonium benzoate, potassium benzoate, tetraalkylammonium benzoate, potassium sorbate, ammonium sorbate, tetraalkylammonium sorbate.

88. The method of Claim 80, wherein the antimicrobial agent is selected from the group consisting of a sulfite, and an alkyl parahydroxybenzoate.

89. The method of Claim 88, wherein the antimicrobial agent is selected from the group consisting of sulfur dioxide, potassium bisulfite, and potassium metabisulfite.

90. The method of Claim 88, wherein the antimicrobial agent is selected from the group consisting of methylparahydroxybenzoate, ethylparahydroxybenzoate, propylparahydroxybenzoate, and n-heptylparahydroxybenzoate.

91. The method of Claim 80, wherein the solvent is selected from the group consisting of water, and an organic solvent.

92. The method of Claim 91, wherein the solvent comprises deionized water.

93. The method of Claim 80, wherein the composition comprises about 0.02 to about 1.5 % by weight cleaning agent; about 0.005 to about 0.3 % by weight antimicrobial agent; and about 90 to about 99% by weight water; based on the total weight of the cleaning composition.

94. The method of Claim 80, wherein the composition has an acidic pH.

95. The method of Claim 94, wherein the pH is about 4.5 to about 6.5.

96. The method of Claim 94, wherein the pH is about 5 to about 6.

97. The method of Claim 80, wherein the surface comprises a metal selected from the group consisting of copper, aluminum, platinum, titanium, silver, tungsten, and tantalum.

98. The method of Claim 80, wherein the surface comprises copper.

99. The method of Claim 80, wherein the surface comprises aluminum.

100. The method of Claim 97, wherein the surface further comprises a dielectric material.

101. The method of Claim 100, wherein the surface comprises borophosphosilicate glass or phosphosilicate glass.

102. The method of Claim 100, wherein the surface comprises a low k dielectric material.

103. The method of Claim 102, wherein the surface comprises a chemical vapor deposited low k dielectric material, or a spin-coat deposited low k dielectric material.

104. The method of Claim 102, wherein the surface comprises silicon dioxide deposited by decomposition of a TEOS precursor.

105. A method of cleaning a semiconductor surface, comprising the steps of:

contacting the surface with an aqueous cleaning composition at a temperature and a time effective to clean the semiconductor surface; the cleaning composition comprising about 0.02 to about 1.5 % by weight cleaning agent; about 0.005 to about 0.3 % by weight of an antimicrobial agent; and the balance solvent, the % by weight based on the total weight of the solution.

106. The method of Claim 105, wherein the cleaning agent is selected from the group consisting of hydroxycarboxylic acids and salts thereof capable of supporting microbial growth.

107. The method of claim 106, wherein the cleaning agent is selected from the group consisting of citric acid, malic acid, tartaric acid, lactic acid, glycolic acid, tartronic acid, and salts thereof.

108. The method of Claim 105, wherein the antimicrobial agent is selected from the group consisting of benzoic acid, sorbic acid, potassium benzoate, ammonium benzoate, tetraalkylammonium benzoate, potassium sorbate, potassium sorbate, and tetraalkylammonium sorbate.

109. The method of Claim 105, wherein the antimicrobial agent is selected from the group consisting of a sulfite, and an alkyl parahydroxybenzoate.

110. A method for removing residue from a surface of a semiconductor wafer, comprising the steps of:

contacting the semiconductor wafer with a cleaning composition to remove at least a portion of the residue, the cleaning composition comprising a cleaning agent selected from the group consisting of hydroxycarboxylic acids and salts thereof, an antimicrobial agent, and solvent.

111. The method of Claim 110, wherein the residue is from a chemical mechanical planarization or polishing.

112. The method of Claim 111, wherein the residue comprises alumina or silica particles.

113. The method of Claim 112, wherein the residue comprises a metal selected from the group consisting of copper, aluminum, platinum, titanium, tungsten, sliver, and tantalum.

114. The method of Claim 112, wherein the residue comprises aluminum or copper.

115. In a chemical mechanical planarization of a semiconductor wafer with abrasive slurry particles, a method of cleaning the wafer after a conductive layer has been planarized to a dielectric layer under the conductive layer, the method comprising the step of:

contacting the wafer with a cleaning composition to remove residual particles remaining on the planarized surface of the dielectric layer and conductive features; wherein the cleaning composition comprises a cleaning agent and at least one antimicrobial agent.

116. The method of Claim 115, wherein the cleaning composition comprises about 0.02 to about 1.5 % by weight cleaning agent, about 0.005 to about 0.3 % by weight antimicrobial agent, and about 90 to about 99% by weight solvent, based on total weight of the composition; the antimicrobial agent selected from the group consisting of benzoic acid, sorbic acid, benzoic acid salts, and sorbic acid salts.

117. The method of Claim 115, wherein the cleaning composition comprises a hydroxycarboxylic acid, a hydroxycarboxylic acid salt, or mixture thereof; and the antimicrobial agent is selected from the group consisting of benzoic acid, sorbic acid, ammonium benzoate, potassium benzoate, tetraalkylammonium benzoate, potassium sorbate, ammonium sorbate, and tetraalkylammonium sorbate.

118. The method of Claim 115, wherein the contacting step comprises spraying the wafer with the cleaning composition.

119. The method of Claim 115, wherein the contacting step comprises placing the wafer in a solvent bath containing the cleaning composition.

120. The method of Claim 119, wherein the contacting step further comprises imparting vibrational energy to the solvent to remove residual particles from the planarized surface.

121. The method of Claim 115, wherein the contacting step comprises dipping the wafer in the solvent bath.

122. The method of Claim 115, wherein the contacting step comprises flowing the cleaning composition over the wafer.

123. The method of Claim 115, wherein the contacting step further comprises scrubbing the residual particles from the planarized surface.

124. The method of Claim 115, wherein the conductive features comprise a metal selected from the group consisting of copper, aluminum, platinum, titanium, silver, tungsten, and tantalum.

125. The method of Claim 115, wherein the conductive features comprise copper.

126. The method of Claim 115, wherein the conductive features comprise aluminum.

127. The method of Claim 115, wherein the residual particles comprise alumina or silica.

128. The method of Claim 115, wherein the residue comprises a metal selected from the group consisting of copper, aluminum, platinum, titanium, silver, tungsten, and tantalum.

129. In a chemical mechanical planarization of a semiconductor wafer with abrasive slurry particles, a method of cleaning the wafer after a conductive layer has been planarized to a dielectric layer under the conductive layer, the method comprising the step of:

contacting the wafer with a cleaning composition to remove residual particles remaining on the planarized surface of the dielectric layer and conductive features; the cleaning composition comprising about 0.02 to about 1.5 % by weight of a cleaning agent, about 0.005 to about 0.3 % by weight antimicrobial agent, and about 90 to about 99% by weight water, based on the total weight of the solution; the antimicrobial agent selected from the group consisting of benzoic acid, sorbic acid, and salts thereof.

130. The method of Claim 129, further comprises scrubbing the particles from the planarized surface.

131. In a chemical mechanical planarization of a semiconductor wafer with abrasive slurry particles, a method of cleaning the wafer after a conductive layer have been planarized to a dielectric layer under the conductive layer, the method comprising the steps of:

placing the wafer in a bath containing a cleaning composition to remove residual particles remaining on the planarized surface of the dielectric layer and conductive features; the cleaning composition comprising about 0.02 to about 1.5 % by weight cleaning agent, about 0.005 to about 0.3 % by weight antimicrobial agent, and about 90 to about 99 % by weight water, based on the total weight of the solution; the antimicrobial agent selected from the group consisting of benzoic acid, sorbic acid, and salts thereof.

132. The method of Claim 131, wherein the wafer is dipped in the cleaning composition.

133. In a chemical mechanical planarization of a semiconductor wafer with abrasive slurry particles, a method of cleaning the wafer after a conductive layer have been planarized to a dielectric layer under the conductive layer, the method comprising the steps of:

scrubbing the wafer in a scrubber while contacting the wafer with a cleaning composition to remove residual particles remaining on the planarized surface of the dielectric layer and conductive features; the cleaning composition comprising about 0.02 to about 1.5 % by weight cleaning agent, about 0.005 to about 0.3 % by weight antimicrobial agent, and about 90 to about 99% by weight water, based on the total weight of the solution; the antimicrobial agent selected from the group consisting of benzoic acid, sorbic acid, and salts thereof.

134. The method of Claim 133, wherein the wafer is contacted with the cleaning composition for about 30 seconds to about 3 minutes.

135. The method of Claim 133, wherein the wafer is placed against a polishing pad in the presence of the cleaning composition.

136. A method of cleaning surfaces of substrates, comprising the step of:

submerging at least a portion of the substrate in a bath of a cleaning composition for a time effective to clean the surface of the substrate; the cleaning composition comprising a cleaning agent and at least one antimicrobial agent.

137. A method of cleaning surfaces of substrates, comprising the steps of:

submerging at least a portion of the substrate in a bath of a cleaning composition; the cleaning composition comprising a cleaning agent and at least one antimicrobial agent; and

bringing the submerged portion of the substrate into frictional contact with a brush to clean the surface of the substrate.

138. A method of cleaning a surface of a substrate, comprising the steps of:

placing a semiconductor substrate in a scrubber; and

scrubbing the substrate while contacting the substrate with a cleaning solution; the cleaning solution comprising a cleaning agent and at least one antimicrobial agent.